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ACOS FACILITIES

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# Navy Energy Management

## Energy 2001

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4 June 2001



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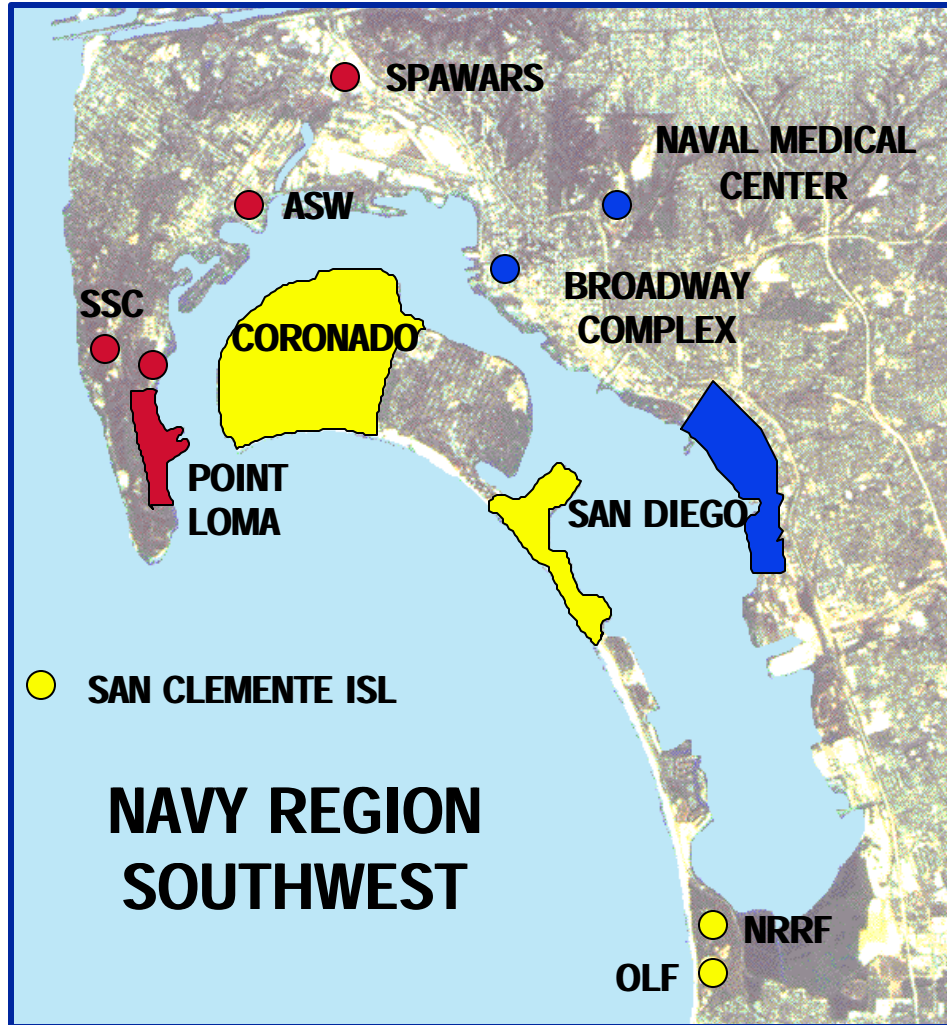
## ACOS FACILITIES

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- **Navy Region Southwest (NRSW) Electricity Background**
- **California Deregulation Background**
- **Energy Actions Prior to Spring 2000**
- **NRSW Mobilization**
- **Demand-Side Initiatives**
- **Supply-Side Initiatives**
- **Energy Management Initiatives**
- **NRSW Long Term Energy Strategy**

# NAVY REGION SOUTHWEST

## SAN DIEGO AREA



● *NAVAL BASE  
POINT LOMA*

● *NAVAL BASE  
CORONADO*

● *NAVAL BASE  
SAN DIEGO*



# NRSW Electricity Background

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- **Navy largest SDG&E customer**
- **Peak PWC San Diego demand 130 MW**
  - 3% of SDG&E peak load
  - 0.3% of California peak load
- **Average demand 90 MW**
- **Annual consumption 800,000 MWH**
- **FY99 bill \$49.5 million**
- **FY00 bill \$70.7 million**
- **FY01 bill \$95 million through April!**



# California Deregulation Background

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- **Statewide electric rates frozen at 1998 levels**
  - **San Diego Gas and Electric (SDG & E) rates un-frozen 1 July 99**
  - **Pacific Gas and Electric (PG&E) and Southern California Edison (SCE) rates remain frozen**
- **Investor-Owned Utilities (IOUs) forced to buy power from (now defunct) California Power Exchange (PX) at day-ahead market prices**
- **IOU's forced to sell generating assets, rely on marketplace for power supplies**
- **Current status...**



# California Deregulation Background

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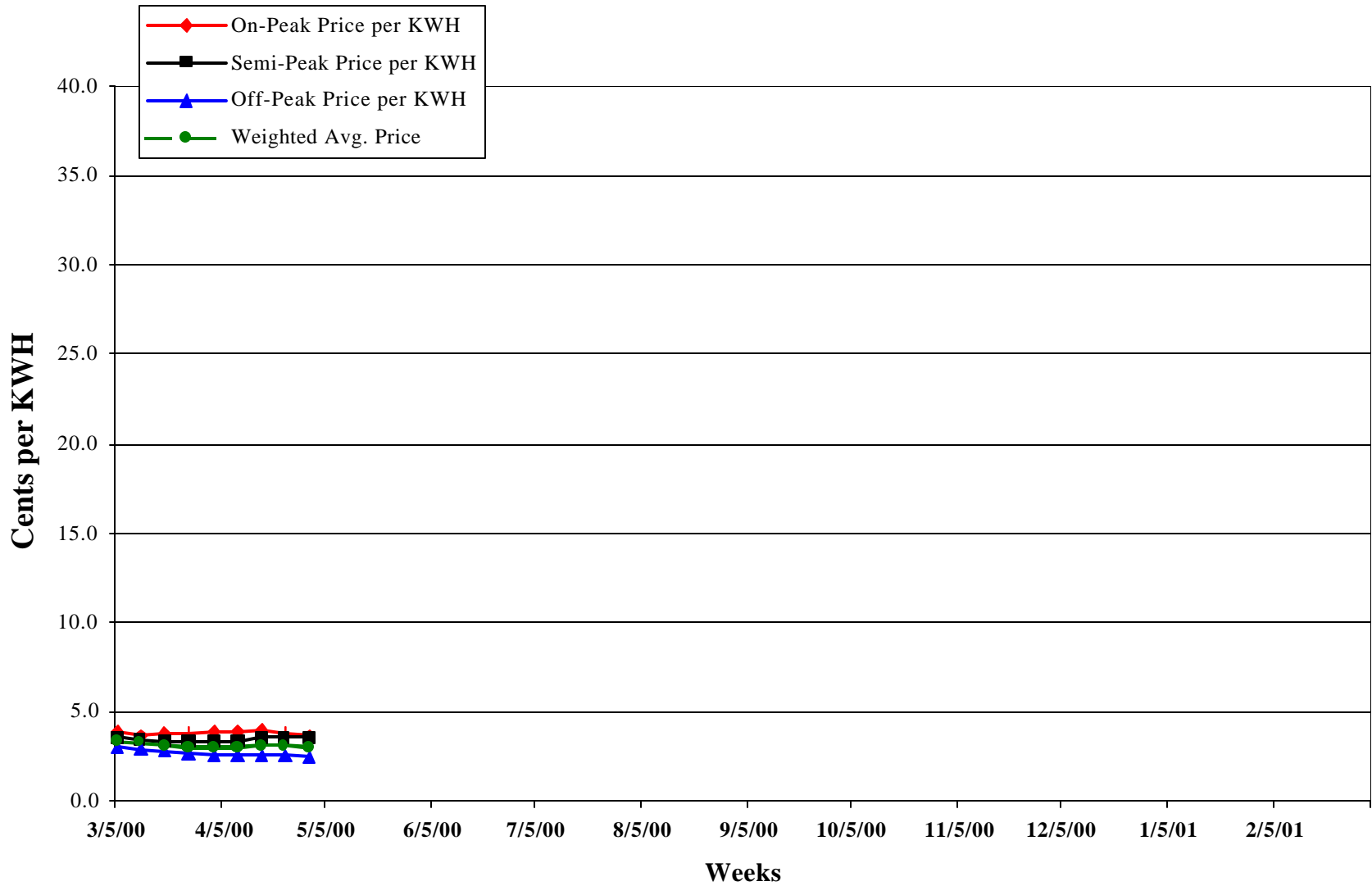
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- **Summer of 2000 begins market “meltdown”**
  - Warm weather, strong economy drive CA demand up
  - Commodity prices as high as \$2.50 per kilowatt-hour (KWH)
  - PX sets price caps lower and lower
  - Generators withhold power from PX, sell to “day of” market
- **SDG&E customers feel full price impact while PG&E and SCE customers remain shielded**
- **Cap SDG&E commodity costs for residents and small commercial at 6.5¢/KWH**
- **PG&E and SCE build \$13 billion debt, default on obligations**
- **PX collapses 31 Jan 01**

# Weekly Electricity Rates per KWH - Commodity Only

## SDG&E A6 (Large Time of Use) Rate

### 3/5/00 - 4/30/00





# Energy Actions Prior to Spring 2000

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- **Re-established Utility Demand Reduction Program**
- **Installed T8 fluorescent lighting throughout San Diego**
- **Started buying power at transmission voltage to reduce costs**
- **Boosted distribution to 12 KV to reduce losses**
- **Expanded electric, water & gas metering**
  - **Over 3,600 electric meters, 2/3 of which are demand-interval meters**
- **Established NRSW Regional Energy Program Office**
- **Set energy-efficient procurement policy**
- **1 MW of photovoltaic & Wind power on line**
- **Started Resource Efficiency Management (REM) program**





# Energy Actions Prior to Spring 2000

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**This 21.6 KW photovoltaic system at Naval Base Coronado produces over 100 KWH per day.**



# Energy Actions Prior to Spring 2000

## ACOS FACILITIES

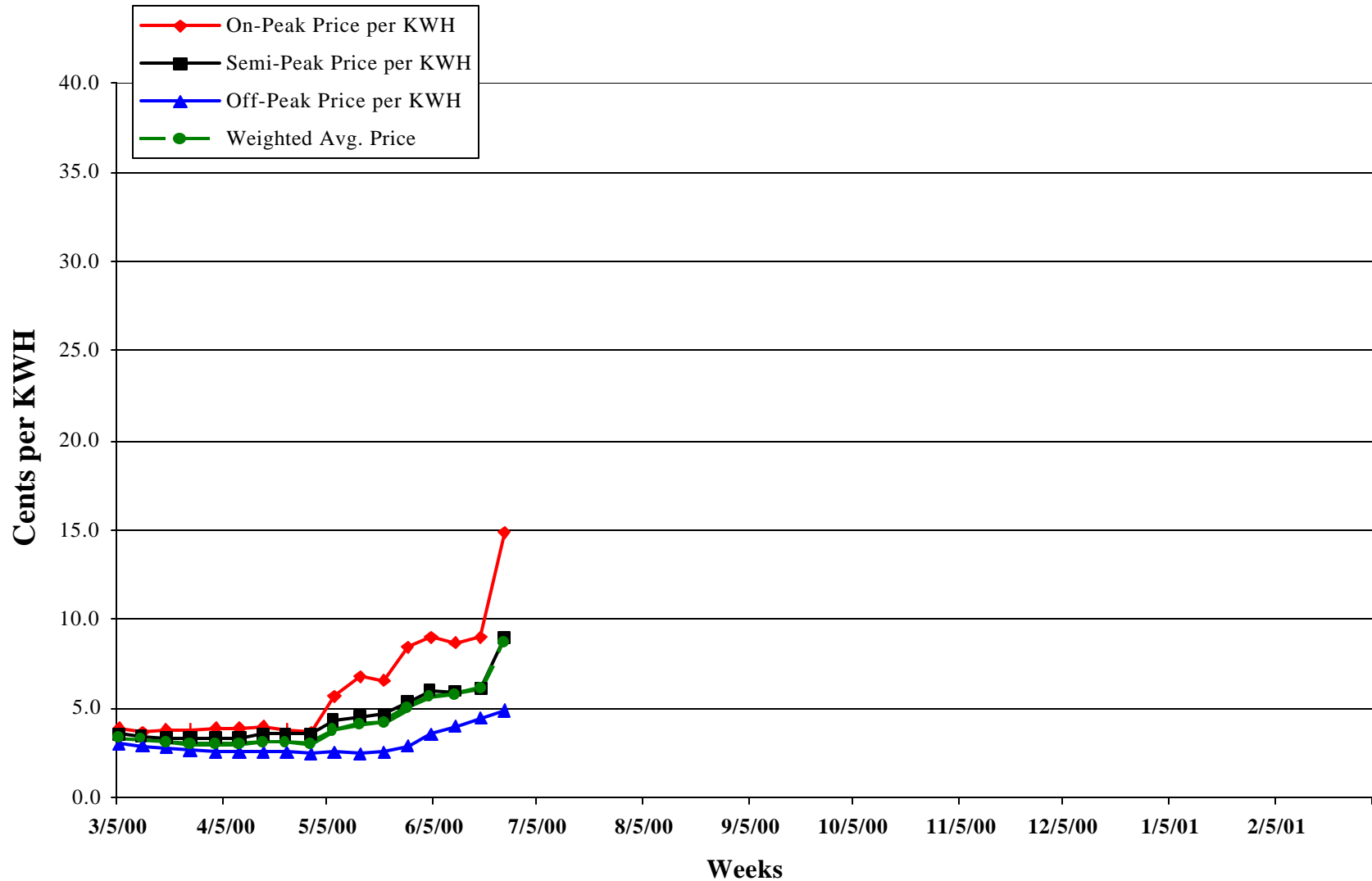


**Three 225 KW  
wind turbines at  
San Clemente  
Island produce  
about 10% of the  
island's power.**

# Weekly Electricity Rates per KWH - Commodity Only

## SDG&E A6 (Large Time of Use) Rate

### 3/5/00 - 6/30/00





# NRSW Mobilization

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- **Daily e-mail energy updates and load reduction alerts; set permanent demand reduction condition early August**
- **Top-level messages prescribing load reduction measures**
- **No air conditioning except medical & critical equipment**
- **Set policy to turn off PCs and office equipment at night**
- **Weekly load profiles for each base plus “top 10” consumers**
- **Weekly electricity action meetings**
- **“Electricity Summits”**
- **DoE/CEC conference calls, December - present**



# Demand-Side Initiatives

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### **Energy Efficiency Projects & Initiatives:**

- **Awarded \$21 million in utility-financed (DSM) projects with 5 year simple payback (Sep 00)**
- **Selected energy savings performance contractor (ESPC) (Nov 00)**
- **Awarded \$2.1 million ESPC delivery order for HID retrofits with 6 year simple payback (Mar 01)**
- **Developing \$30 - \$60 million in additional DSM & ESPC projects for 2001 award**
- **Eliminating 80,000 incandescent light bulbs**
- **Replacing 1,200 refrigerators**
- **Adding 5 more REM's at outlying bases**





# Demand-Side Initiatives

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**Example: Replaced 400 Watt HID lights with T5 high output fluorescents, Bldg 326 NAB, before (L) & after (R). Note drop in demand on MVWeb screen.**

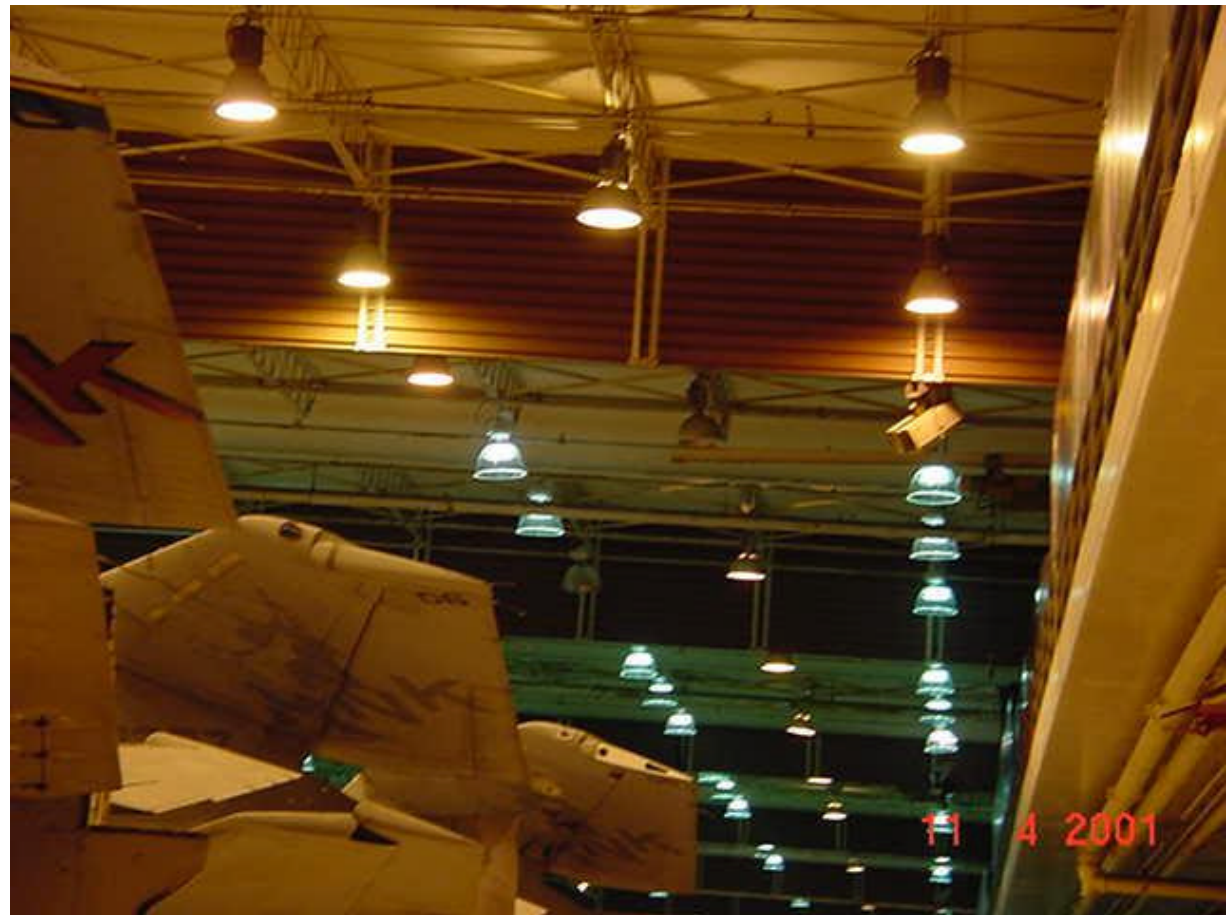


# Demand-Side Initiatives



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**Example:  
Replaced 400  
Watt high  
pressure  
sodium lights  
(foreground)  
with 250 Watt  
metal halides  
with Stingray  
fixtures,  
Hangar 1456,  
NAS North  
Island.**





# Demand-Side Initiatives

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## **Demand Reduction Initiatives:**

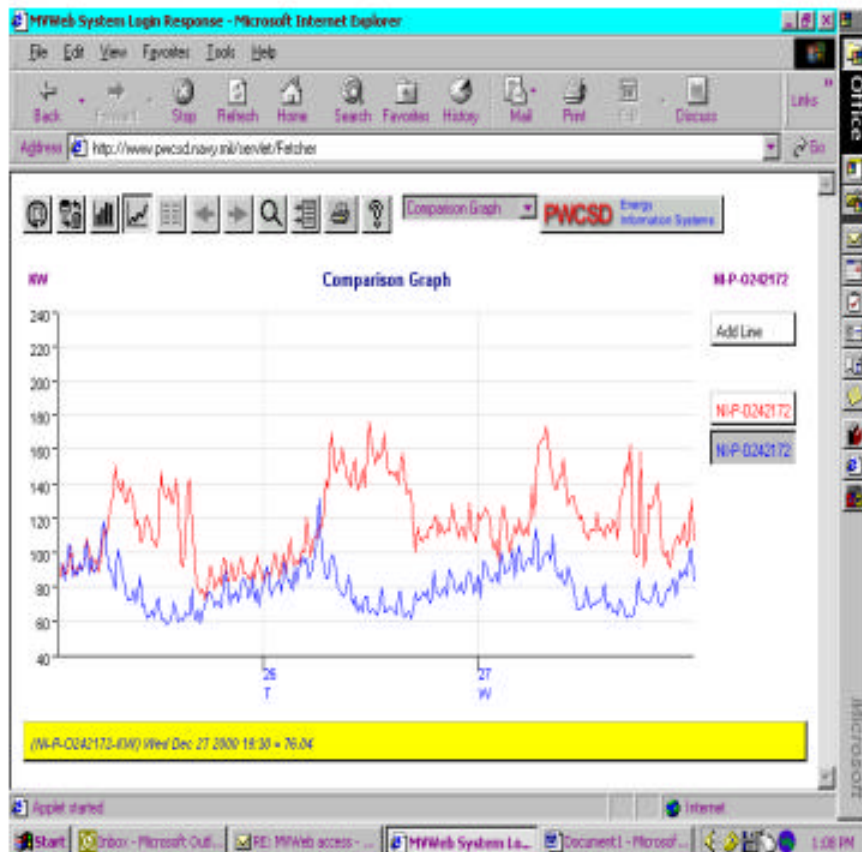
- **Using MVWeb as primary tool to:**
  - **Identify electricity anomalies and demand reduction opportunities,**
  - **Work with operators to help them reduce demand, and**
  - **Measure effectiveness of energy management efforts**
- **Developing initiatives to fit new grant & incentive programs**
- **Received \$1.5M in grants & incentives to date**



# Demand-Side Initiatives



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### **Example: Use of MVWeb to identify opportunities**

MVWeb showed an unusual demand pattern at the Deep Submergence Unit at Naval Base Coronado. A Chief identified this load as their 40 Hp air compressor, which is oversized for their needs. He agreed to replace it with a 10 Hp unit.



# Supply-Side Initiatives

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### **Electricity Procurement**

- **Contracted for 80 MW of fixed price power (Apr 01)**
- **Participating in utility-run demand reduction programs**
  - **Real-time metering**
  - **Payments for actual reductions**

### **Distributed Generation Initiatives:**

- **Planning two 75 KW microturbines at NAB Coronado; waste heat will pre-heat central hot water system**
- **Planning additional 730 KW in photovoltaics in 2001**
- **Developing ESPC D.O. for 3.6 MW cogen plant expansion at Naval Medical Center, San Diego**



# Energy Management Initiatives

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### **Short Term Operational Changes**

- **Scheduled operations & training outside peak demand periods, e.g., equipment testing**
- **Compressed training schedules, e.g., 4-day weeks**
- **Restrictions on admin & holiday lighting**

### **Personnel Behavior Changes, through:**

- **All-hands energy training**
- **Building energy monitor network**
- **1-on-1 discussions with key personnel**
- **Briefs to focus groups, e.g., Command Master Chiefs**
- **Recognition of top performers**
- **Web-enabled access to building electrical demand data**



Comparison Graph

**PWCSD** Energy Information Systems

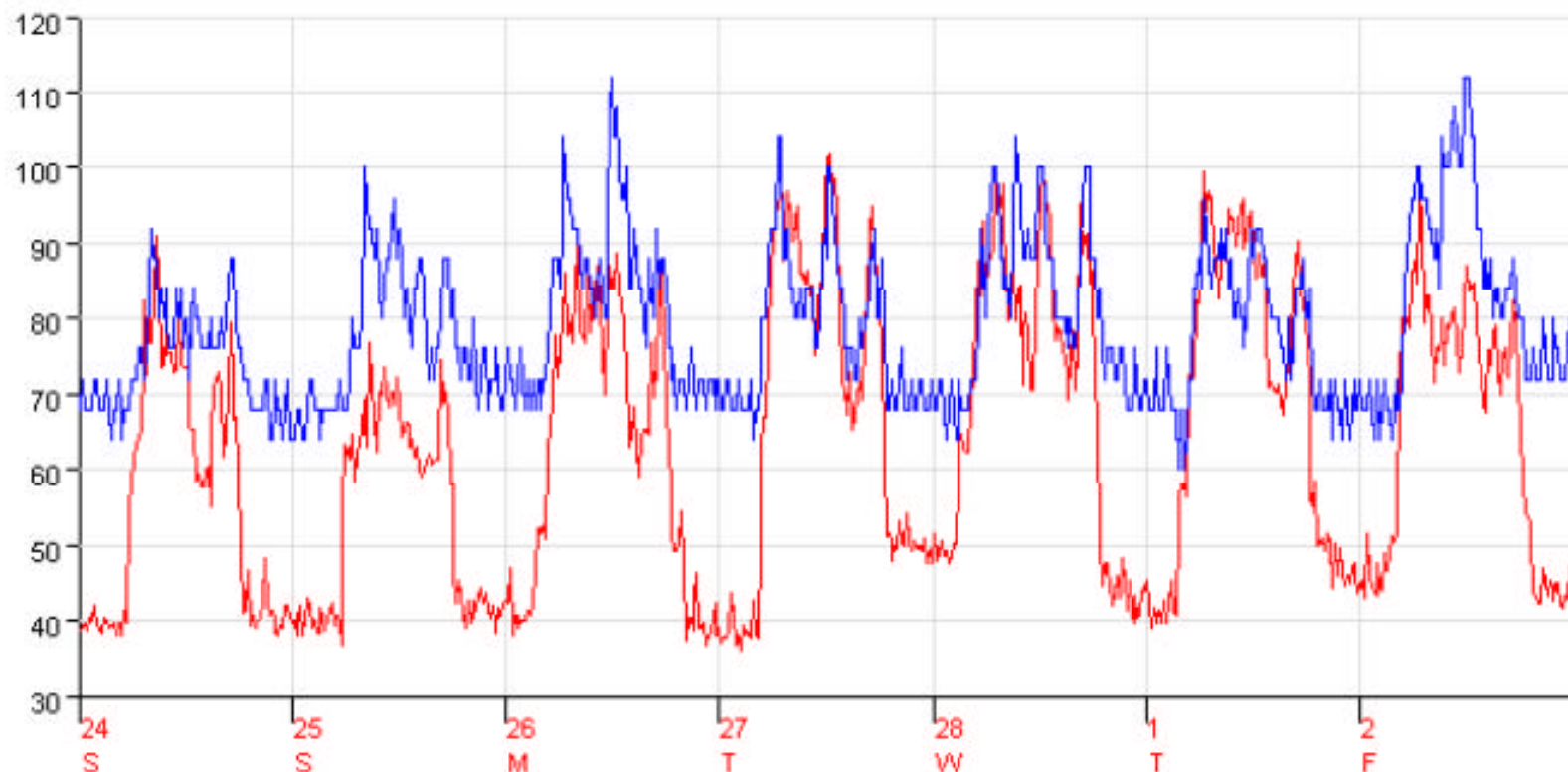
# KW Comparison Graph

**NAB-B-300**

Add Line

NAB-B-300

NAB-B-300



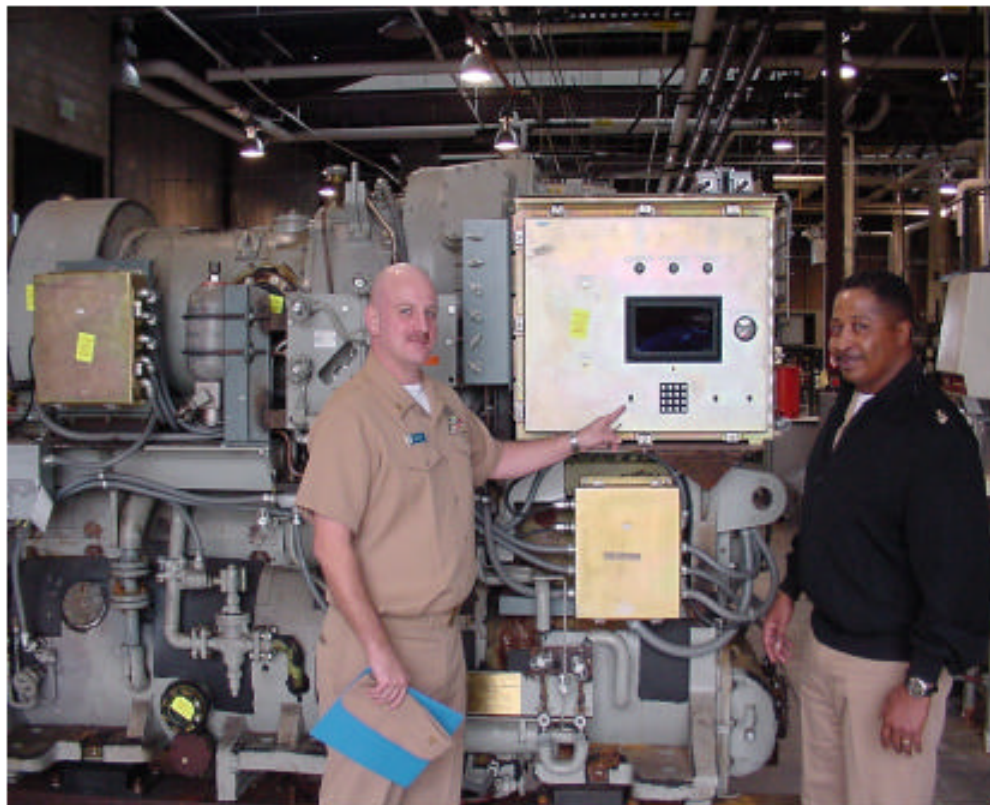
(NAB-B-300-KW) Fri Mar 2 2001 24:00 = 42.16





# Energy Management Initiatives

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### **Example: Scheduling training outside peak demand periods**

**MVWeb showed a 120 KW spike at a Fleet Training Center building. The spike is caused by a large pump used for training. The instructors in the photo agreed to minimize use of the pump and to schedule it outside peak demand periods.**



# Energy Management Initiatives

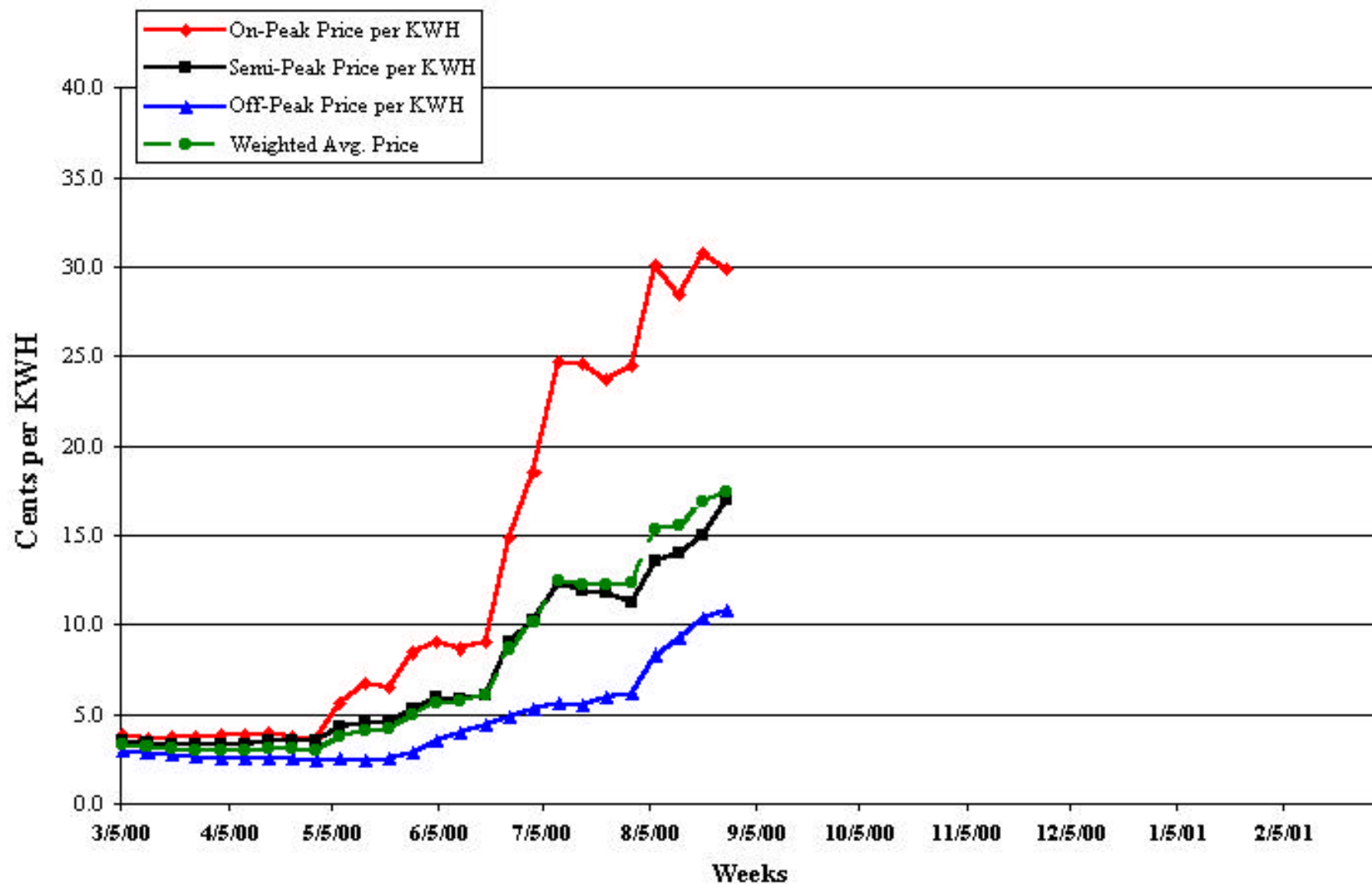
## ACOS FACILITIES

### **Example: Recognition of Top Performers**

**During Energy Awareness Week 2000 the Commanding Officer, Naval Base San Diego presented the Civilian Meritorious Service Medal to Mr. Forrest Roark, Site Manager for Bachelor Housing for his proactive efforts to equip bachelor housing buildings with energy efficient equipment.**



**Weekly Electricity Rates per KWH - Commodity Only**  
**SDG&E A6 (Large Time of Use) Rate**  
**3/5/00 - 8/31/00**





# Energy Management Initiatives

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### **Energy Awareness Activities**

- **Extensive Energy Awareness Week activities, all bases**
- **Daily newspaper, TV & radio coverage**
- **Frequent high-level briefings**
- **On-going, all-hands energy awareness training**
- **Articles in Navy & Marine Corps newspapers, “plan of the day”, other publications**
- **100’s of banners, signs and marquee notices**
- **Flyers & community meetings for family housing residents**
- **NRSW energy web site**





Regional Energy  
Program Office  
Energy  
Policies  
NRSW  
Energy Data  
Energy Training  
& Awareness  
Energy Efficient  
Procurement  
Energy  
Awards  
Energy  
Publications  
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Case Studies

# REPO

## Regional Energy Program Office

Tuesday, March 06, 2001

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You are Visitor Number: 59 since February 5, 2001

## Regional Energy Program Office

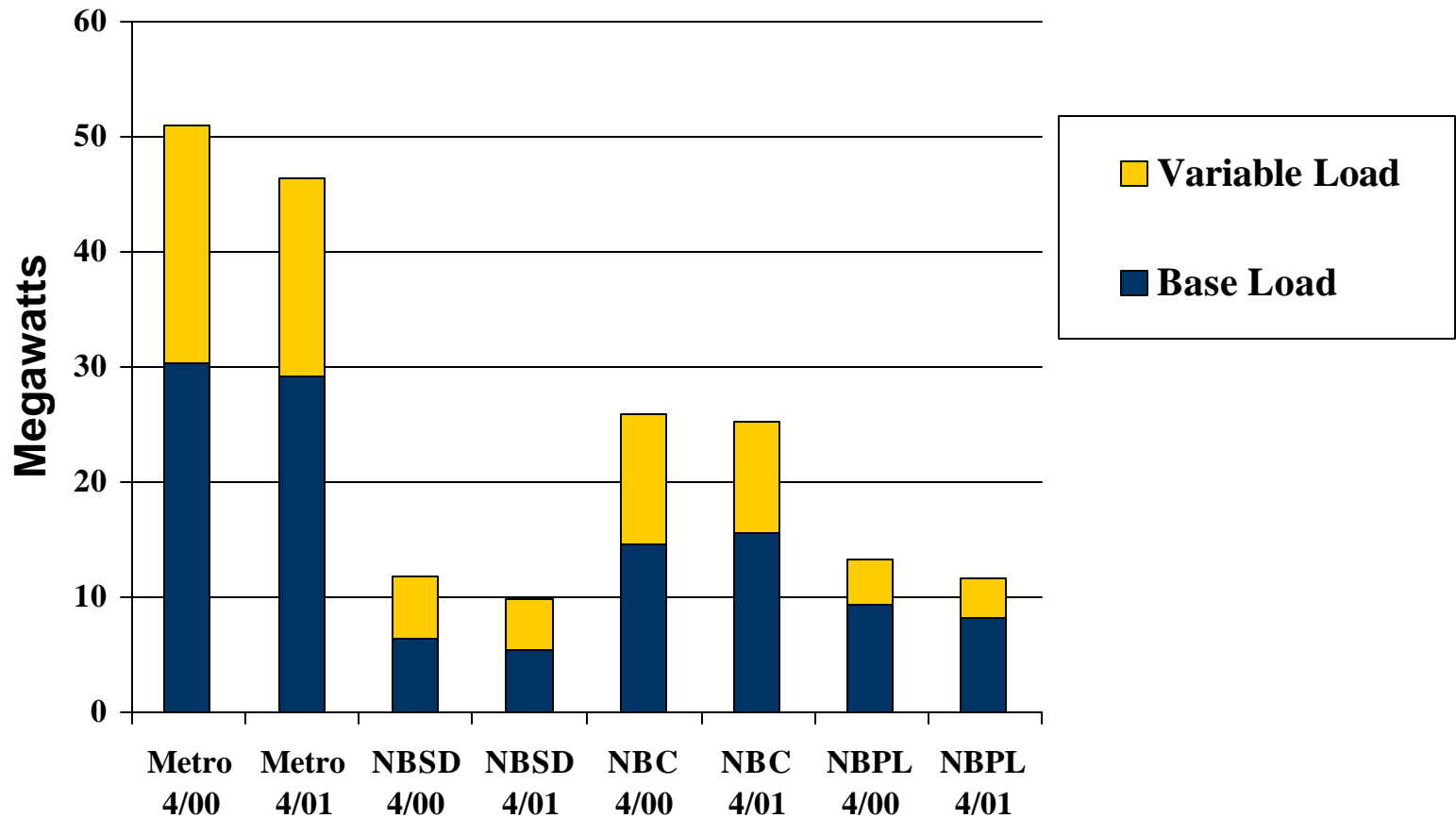
Welcome to the Navy Region Southwest (NRSW), Regional Energy Program Office (REPO) web site. This site provides energy management data, program information, references, links, and practical tools to NRSW energy and facilities managers to help them operate their shore facilities more efficiently. The information provided should also be of use to other utility customers of the Navy Public Works Center (PWC), San Diego. REPO will keep this site as current as possible and will continue to add value-added tools and resources as they become available. Please contact [REPO](#) with any suggestions for improving this site.

### About This Site

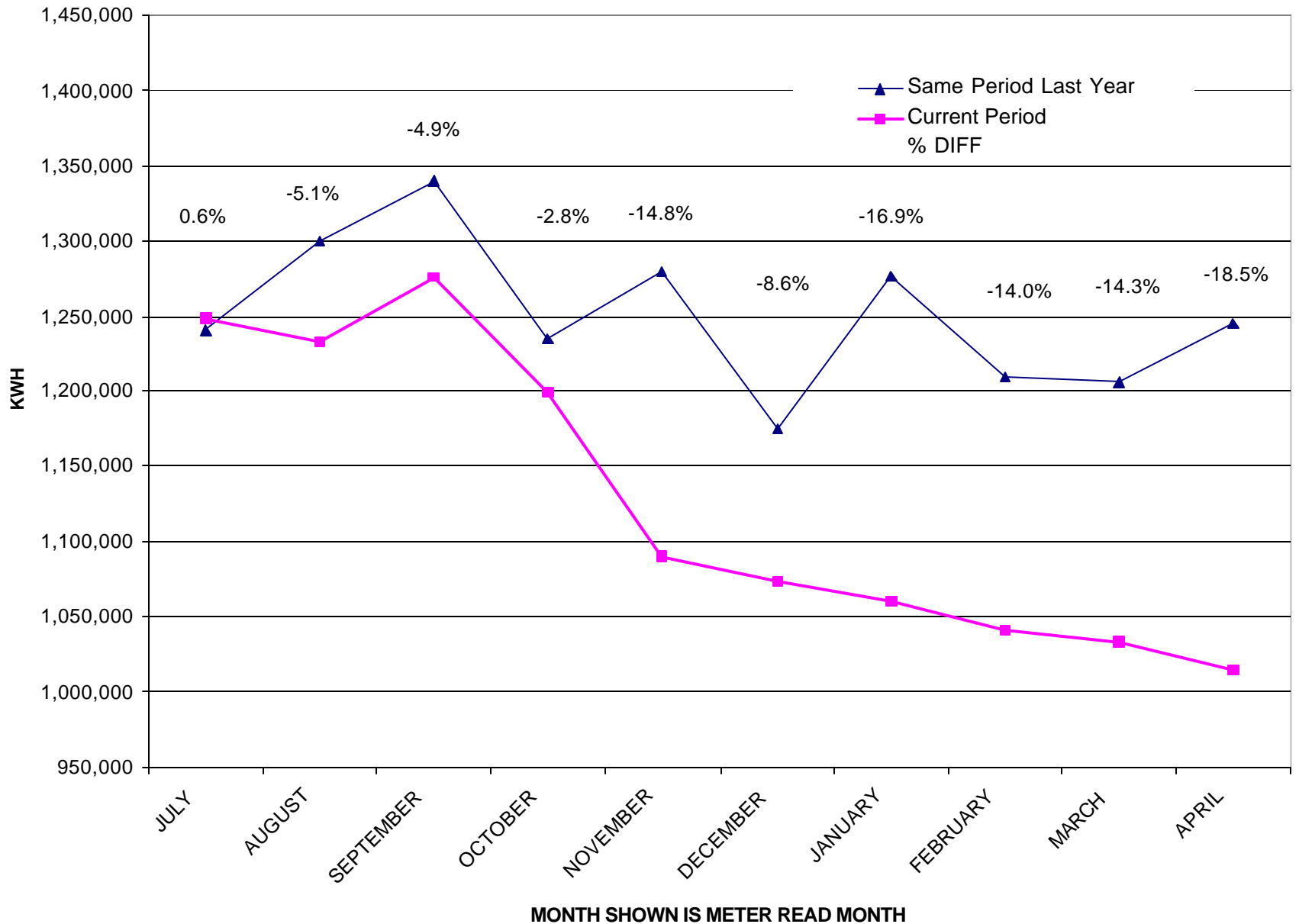
In times of skyrocketing energy prices and shortages of supplies, such as San Diego experienced in the summer of 2000, good energy management is the first line of defense

# Shore Demand Components

## April 01 vs. April 00



# METRO SAN DIEGO BASES AVERAGE DAILY ELECTRIC CONSUMPTION



# Weekly Electricity Rates per KWH - Commodity Only

## SDG&E A6 (Large Time of Use) Rate

### 3/5/00 - 3/25/01

